Water Matters

Irrigation and water management advice from the Cotton and Grains Irrigation Knowledge Management Project.

WATER MATTERS in this issue will feature three separate case studies

Want a bigger farm? Buy it with furrow optimisation!

CASE STUDY 1...

WHO: Donald Baartz

WHERE: Bongeen, Darling Downs Qld

CONSULTANT: Jamie Innes, Landmark Pittsworth

CROPS: cotton, sorghum, chickpea

AREA: 840 hectares, up to 75 per cent cropped annually

FURROW OPTIMISATION TECHNIQUE: Increased inflow rates to reduce infiltration opportunity time (either through use of more syphons or increased hydraulic head in head ditch) and cessation of irrigation when water first comes through to the tail drain according to Irrimate recommendations. Splitting the field to further improve efficiency and improve crop performance should also be considered.

Inside 10 years, Cecil Plains cotton and grain farmer Donald Baartz feels he has seized 10–15 per cent more productive irrigation land without needing to buy one more acre — a useful economy given current land prices in the sought-after Bongeen area. Donald's current practice of optimising furrow irrigation means he can produce an increased 10 to 12 per cent total cotton production using the same amount of water.

Up to three-quarters of his 840 hectare farm is cropped in any year, with about 250 hectares under irrigation annually.

Cotton is the mainstay with maize as a grain crop and refuge, with semi-irrigated sorghum and chick peas.

Donald has relied on a range of soil moisture probes for at least eight years and in the current season has been involved in a project funded by the Condamine Alliance — a regional body seeking to enable sustainable resource management in the basin.

"And although there is a cost involved in buying and setting up the probes, then the time factor taking the readings, after eight years using them, we wouldn't do without them," Donald said.

"Once you have used probes for a while, you get to know (the pros and cons) and I put a lot of faith in the experience of my agronomists, Ken Bullen and Mike Balzaer of B&B Agricultural."

Donald reports his 2007 season cropping area was well down due to the total absence of overland water flows to boost reserves.

Added to that he has had no rain since early January and the biggest fall was 35mm all summer — the average annual rainfall was about 26 inches (624mm) up until the past five years.

Leading the on-farm work, consultants Jamie Innes and Liz Apuli set up Irrimate syphon flow meters and advance sensors at defined points along furrows.

Donald Baartz.

Donald said that while he felt his water use efficiency was already good, the Irrimate system would allow him to more closely assess this with actual measurements.

"And in getting this data, the ultimate aim is to map and benchmark each paddock to give uniformity to the irrigation regime," he said.

"I found the Irrimate advance meters in particular really helpful, because as we have metered bores (situated close to the paddocks) and minimal loss in the head ditch, the advance meters combined with the flow meter readings will let us know when the water hits it so we can work out in-field infiltration rates more easily."

By mid-season, Jamie was confident of achieving 90 per cent application efficiency and nearing best-of-district practice. Jamie has worked with Donald to fine-tune the irrigation to begin when the deficit is within a prescribed range.

"When a field is in that moisture deficit zone, that is when we have timed the watering to begin," Jamie said.

"We are aiming at 90 per cent efficiency on Donald's cotton fields, but in this area, application efficiency can be anywhere between 65 per cent and 95 per cent — and farms in the 90s are rare.

"Donald's experience is like most irrigators — in knowing the ideal time to pull siphons and stop the pumps. Rather than tell farmers when they should irrigate, the aim with Irrimate is to optimise their irrigation volumes for maximum productivity by better matching how much water is required with that applied."